

ABSTRACT OF THE DISCLOSURE

Real time high speed high resolution hyper-spectral imaging. (a) electromagnetic radiation collimating element (16), collimating electromagnetic radiation (44) emitted by objects (12) in a scene or a sample (14); (b) optical interferometer (18), receiving and dividing collimated object emission beam, generating interference images, and ~~piezoelectrically~~ determining and piezoelectrically changing magnitude of optical path difference of divided collimated object emission beam; optical interferometer (18) includes: beam splitter (20'), fixed mirror (22), movable mirror (24), piezoelectric motor (26), displacing movable mirror (24) along axis (60), distance change feedback sensor (28), sensing and measuring change in distance of movable mirror (24) along axis (60), piezoelectric motor controller (30), actuating and controlling piezoelectric motor (26); and thermo-mechanically stable optical interferometer mount (32A); (c) camera optics (34), focusing interference images of each optical path difference; (d) detector (36), recording interference images; (e) central programming and signal processing unit (38), and (f) display (40).